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FEBRUARY

R/D COMPUTING

Dedicated to TI 99/4A and 9900 Computer Systems

Ryte
.....Data.....

210 MOUNTAIN STREET,
HALIBURTON, ONTARIO K0M 1S0
(705) 457-2774

Ah February! As in the ancient Chinese curse, Isn't life 'interesting'?

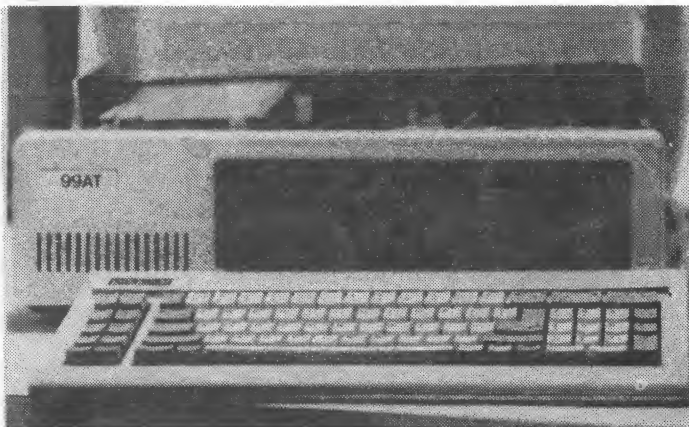
According to theory, Myarc ACTUALLY shipped computers this month. At this rate, folks should have the machines in hand within a short period of time. The delivery date just seemed to fade into the far distant future.

Next major hurdle is going to be the documentation of the system from a hardware and then the software level. From experience with other new computers, this will take some time to accomplish. The first Amiga I examined had NO documentation and very bug prone demo software. Par for the course.

Speaking of which:

99AT EXPANSION SYSTEM UPDATE:

In the photo below, you can see a 99AT Expansion System. The typical delays have plagued this project - not to mention the costs to get something like this out the door at a price that TI owners would touch. The process of: [design, prototype, test, certify, alter, re-design, prototype, test] to produce a new hardware development IS arduous and fraught with numerous delays.



Definitely fits the category of "easier said than done". Yet, in this instance, the returns and interest generated have been sufficient to continue with the project beyond a prototype stage. (Much more so than the "GPL Memory Module" which garnered a very small interest level from our mailings and newsletter report. THAT project is still viable, but has been pushed off the back burner due to the lack of interest.)

It becomes painfully obvious that any company engaged in researching products and taking such projects to a manufactured stage runs a large financial risk. This includes Myarc, CorComp, Mechatronic, DataBioTics, Atronic, RAVE and anyone else willing to produce products for TI 99/4A owners. Within the TI market several excellent products have never reached any sort of production basis. Other products, like Millers Graphics GRAM KRACKER have failed to achieve a profitable level - even with numerous good reviews in every publication going.

One dealer estimated that MG sold around 1000 GRAM KRACKERS. Barely enough to pay for the development and board design / CAD layout costs.

This only means one thing to TI owners around the world: your 99/4A cannot receive support from these companies without YOUR SUPPORT.

A point was made that Borland did market TURBO PASCAL at a low price: \$69.95 / \$109.90 / \$124.96 in the pages of BYTE Magazine (600,000 readers!). This level of pricing is considered over priced in the TI community.

Introducing the greatest thing for 99/4A computer graphics since, well, the introduction of the 99/4A!

For years TI-99/4A owners have looked longingly at programs such as Printshop (R) and Newsroom (R) for Apple, Atari and Commodore computers. We all have wished we could do the things that Fontrix (R) does on the IBM PC. Well, now there is a program for the TI-99/4A that does these things, and because of the special features of the 99/4A, does a whole lot more.

Font Writer, by J. Peter Hoddie (a master programmer — author of Pre-Scan It! and system software for the Myarc Geneve computer) makes text and graphics come truly together for the first time on the 99/4A. Font Writer will combine any TI-Writer text files, TI-Artist or CSGD fonts, and TI-Artist instances the way you want them to make an otherwise drab report, letter or article come alive!

Font Writer, like TI-Writer, is more than one program. The first program in the package is Font Editor — a program that will let you edit existing TI-Artist or CSGD fonts, or create new ones from scratch. Font Editor contains an innovative editing window, dozens of powerful menu-selectable utilities, and supports even more powerful user-defined macro drawing commands for drawing often used figures with a single command. As powerful as it is, like all Asgard products it's designed to be friendly and easy-to-use. It is so flexible that you can even edit TI-Artist instances.

The real power of Font Writer, and it's most innovative part, is the Text Formatter. This program accepts standard TI-Writer files with virtually every imbedded text formatting command supported by TI-Writer, along with many new such commands for graphics support, to allow you to integrate text fully with graphics easily. Text Formatter accepts new commands for printing text in different fonts, including pictures and other graphics, and more. This easy-to-use program is as simple to use as TI-Writer, yet does so much more.

The last, but not in any way least program in the Font Writer package is a powerful organization tool for graphics files. If you have ever tried ordering and maintaining TI-Artist fonts, slides, instances and pictures, you will later wonder why you ever tried without it.

Font Writer requires Extended BASIC, 32K, and a disk drive system. TI-Writer and TI-Artist are highly recommended. Extensive documentation by Walter Howe is included. Available for a suggested price of \$24.95 from official Asgard Software dealers, from Teledata* Guide on Compuserve (page TDG-4), by sending Source Mail to TI9720 on Source, or directly from Asgard. All major credit cards accepted.

Asgard Software

P.O. Box 10306
Rockville, MD 20850

T.O.D.

TOD EDITOR UPDATE from Asgard Software, Box 10306B, Rockville, MD 20850

Now available to owners of Asgard Software's TOD EDITOR: Version 3.0 of this popular program.

The newest version of this product features numerous program corrections, as well as some important new features.

Version 3.0 is more compatible than ever with the Myarc Disk Controller Card. Additionally, numerous errors in the program have been corrected. New features include the ability to edit all 55 creatures in an adventure, the maximum permitted by the module - not just 51 as available through Version 2.1. The new version also has an enhanced graphic editor which allows you to save favourite monster designs in separate files on disk for use in other adventures.

The newest version of TOD EDITOR is proof of our commitment to providing high quality products to our customers, and then providing after purchase service in the form of program updates to correct problems, add new features plus inexpensive and quick servicing to damaged merchandise.

To obtain the newest version of TOD EDITOR, return your master disk, along with an update fee of \$2.50 for registered owners (ie: those that receive this notice in the mail) or \$5.00 and the master disk if you are an unregistered owner.

Thank you - Chris Bobbit ASGARD

HORIZON

HORIZON RAMDISK MODIFICATION:

Do you have a Horizon RAMDISK? This is a great product which took a very high talent level to produce. It is one of the best RAMDISKS available on ANY machine. Edward Hallet has provided the means to

expand the memory available from 180k (DS/SD 720 SECTORS) to 256k (976 SECTORS). This increases the storage capacity closer to a DS/DD disk. You must add one 74LS154 (4 to 16 decoder), one 74LS02 (NOR gate) and eight 8K 6264 LP-15 memory chips. One 74LS138 (3 to 8 decoder) is removed and the DSR code is modified to recognize the extra memory. CAUTION: This modification is undertaken at your own risk and may void your Horizon warranty.

REMOVE THE NICAD BATTERIES FROM THE RAMDISK BEFORE STARTING. AVOID ANY STATIC DAMAGE TO THE 6264'S.

1. Remove U1 the original 3 to 8 decoder from its socket.

2. Remove the EIGHT piggybacked pairs of 8k RAM chips from their sockets U3 - U6 and U12 - U16.

3. Remove U2 the original 4 to 16 decoder (74LS154) from its socket.

4. Remove U10 the original NOR gate from its socket.

5. Install a THIRD ADDITIONAL 8k RAM chip piggybacked on top of each of the eight pairs removed. Connect each pin to the ones below WITH THE EXCEPTION OF PIN 20. Carefully bend each pin 20 out to match the pin 20 below. Install these eight piggybacked TRIOS into their sockets U3-U6 and U12-U16. Reconnect the ORIGINAL select lines from pins 20 on the CENTER chips to the ORIGINAL POINTS on the expansion jack next to U3.

6. Install the ADDITIONAL 4 to 16 decoder chip (74LS154) piggyback on top of the ORIGINAL decoder U2. Connect PIN 12 and PINS 20 thru 24 to their corresponding PINS below. Bend pins 1 thru 11 and pin 13 out at right angles. Reinstall the piggyback pair of decoders in the U2 socket. Connect lines from the upper chip PINS 1 thru 8 as follows:

PIN 1 TO U1 SOCKET PIN 15

PIN 2 TO U1 SOCKET PIN 14

PIN 3 TO U1 SOCKET PIN 13

PIN 4 TO U1 SOCKET PIN 12

PIN 5 TO U1 SOCKET PIN 11

PIN 6 TO U1 SOCKET PIN 10

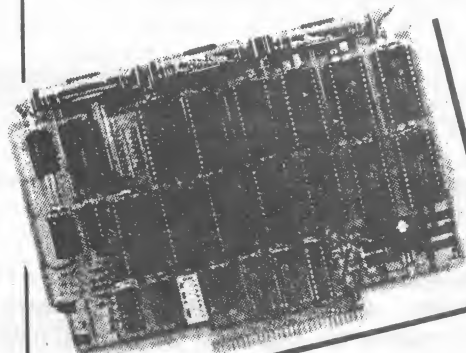
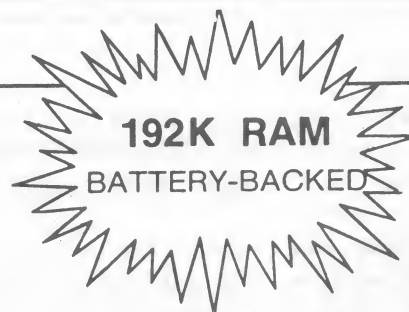
PIN 7 TO U1 SOCKET PIN 9

PIN 8 TO U1 SOCKET PIN 7

These provide the CHIP select

The

HORIZON RAMDISK



\$53* PC Board, Manuals & Software

\$45* Five or more boards with one manual and set of disks.

* PARTS AVAILABLE ELSEWHERE FOR ABOUT \$100/720 Sector

*OHIO RESIDENTS ADD 5.5% SALES TAX

NOT JUST ANOTHER RAMDISK...

THE ONLY BATTERY-BACKED RAMDISK for the TI-99/4A. The on-card batteries recharge when you operate your computer. The batteries will last for years and the entire 192K RAM memory is battery-backed including the DSR RAMDISK Operating System.

THE ONLY FULLY OPEN PE-BOX CARD. The Horizon RAMDISK contains no EPROM or ROM. The DSR Operating System is in RAM and is loaded from a floppy disk. DOCUMENTED SOURCE CODE is provided for those who wish to understand AND MODIFY the Operating System.

THE ONLY PERIPHERAL WITH DSR RAM which allows the assembler language programmer to write Device Service Routines. The Horizon RAMDISK memory is decoded entirely within address space >4000 to >5FFF. A special loader (provided with SOURCE CODE) enables AORG Editor/Assembler object files to be placed in the RAM on the card. You can write all new CALL subprograms for TI BASIC, power-up and interrupt service, and DSR routines making use of the 192K battery-backed RAM. >4000 to >57FF is always enabled, and the remaining 186K is paged in 2K at a time in >5800 to >5FFF with the LDCR instruction.

THE ONLY RAM CARD YOU CAN BUILD your self at substantial savings over fully constructed models. You can buy the printed circuit board, user's manual, Operating System software, and an ILLUSTRATED step-by-step construction manual with schematic and parts list and get the parts wherever you can find the best deals. Hundreds of TI Enthusiasts have built the Horizon RAMDISK. If you've had any experience building electronic kits you can too — at SIGNIFICANT SAVINGS! (If you want a fully constructed, tested and warranted unit, we sell those too.)

CONSTRUCTED - 90 DAY WARRANTY

| | |
|-------------------------|-------|
| 192K - 720 Sector | \$210 |
| 104K - 360 Sector | \$165 |

EASY TO USE...

- > Functions just like a TI floppy drive; only FASTER! Load the operating system with a single key press, then access the RAMDISK as you would a floppy disk.
- > Compatible with software using standard DSRLNK including sector copy, Disk Manager II, MG Explorer, TI Writer, TI Multiplan, and Editor Assembler. Compatible with TI BASIC, TI Extended BASIC, TI and Wycove FORTH, TI LOGO, and Assembly Language.
- > Comes with the DM-1000 Disk Manager, Loads from BASIC or Ext BASIC in 1 second with CALL DM.
- > Compatible with existing hardware including MAXIMEM, GramKracker, and the RAM/GRAM Card.
- > Accepts drive names from DSK1 to DSK6.
- > DIP switch sets CRU Base from >1000 to >1700.
- > Adds CALL Subprograms to BASIC to: 1) set the drive number, 2) set write protect, 3) set maximum sectors, 4) enable DSR for direct access, 5) execute M/L code from BASIC. DELETE "XBCALL" downloads CALLs to low 8K for execution from running Ext BASIC programs.
- > Comes with complete DSR SOURCE CODE. Explains how to write A/L CALL routines to enhance TI BASIC.

HORIZON COMPUTER LIMITED

P.O. Box 554

Walbridge, Ohio 43465

signals to the original (center layer) of the 8k RAM chips.

Connect lines from the UPPER chip pins 9 thru 11 and 13 thru 17 as follows.

PIN 9 TO PIN 20 U3 - TOP 8K CHIP
PIN 10 TO PIN 20 U4 - TOP 8K CHIP
PIN 11 TO PIN 20 U5 - TOP 8K CHIP
PIN 13 TO PIN 20 U6 - TOP 8K CHIP
PIN 14 TO PIN 20 U12 - TOP 8K CHIP
PIN 15 TO PIN 20 U13 - TOP 8K CHIP
PIN 16 TO PIN 20 U14 - TOP 8K CHIP
PIN 17 TO PIN 20 U15 - TOP 8K CHIP

These provide the chip select signals to the ADDITIONAL eight 8k RAM chips on the top layer.

7. Install a new NOR gate (74LS02) piggybacked on top of the original NOR gate. Connect pins 2, 7 and 14 to the corresponding pins below. Bend pins 1, 3-6 and 8-13 outwards. Reinstall the piggybacked PAIR of NOR gates into U10. Connect lines as follows:

PIN 1 TO PINS 18 and 19 U2 UPPER CHIP.

PIN 3 TO U1 SOCKET PIN 6

These provide the chip select signal for the U2 upper 74LS154 (4 to 16 decoder) to fully decode the available memory address lines.

Pins 4 through 6 and pins 8 through 13 of the upper NOR gate U10 are not used and are left UNCONNECTED. They may be used in further modifications. This completes the hardware modifications to the HORIZON RAMDISK Card. Next the DSR software must be modified so that the additional memory can be used in the system. Due to the length of the article, you may send a disk initialized in YOUR format to us to receive a copy of the modified source code.

RAPID COPY

REVIEW: RAPID COPY Available from TEXAMENTS, 53 Center Street, Patchogue, New York 11772

Price: \$14.95

Spend any time copying disks? How about formatting disks? Catalog functions?

You need Rapid Copy. First there were X number of file passes. Then there were three pass copiers. Now the top disk copy program has been introduced: VERY FAST, efficient,

reliable, easy to load and fully compatible with every disk controller out there (for a change!) THIS ONE TAKES THE PRIZE. Now we use it each and every day for many functions.

I've felt that many copiers were slow and often cumbersome to use. When doing certain duplication tasks, other disk copy programs always provided LOTS of time to drink coffee, read, stare out the window etc. Not so with RAPID COPY. This one will FORMAT and COPY an entire disk in less than 60 seconds. A double sided double density disk takes perhaps 77 seconds. Remember, this includes formatting the disk to the same density as the original!

Like it? YES! You can tell! When I saw this one run, my money was on the table immediately.

REVIEW TWO: A review of Font Writer was in order... but Chris Bobbit of ASGARD SOFTWARE informs me that an Assembly language version is due out in the near future.

Instead let me digress into the land of "vapourware"... Monty Schmidt is working on a really interesting utility program. This one carries a Command Line approach to managing files, inspecting disks, checking file contents, batch file operations, batch and automatic execution of files, running E/A programs etc. Sounds very interesting. Details at a future date. Following is an excerpt from Monty's new book "TECHNICAL DRIVE"

"Peripherals and Device Service Routines (DSR's): an overview.

When the TI 99/4A was designed, Texas Instruments did not know what peripherals would be added to it in the future. Thus, they needed a flexible way of interfacing new devices such as, RS-232 interfaces, disk controllers, clocks etc. without extensive internal hardware modification of the computer. The Communications Register Unit (CRU) and the memory space from >4000 to >5FFF fulfill this requirement.

The CRU bits in the console are bits which can be written to, or read from, depending on how they are defined. They are used for such purposes as peripheral enable/disable, device control, bank switching of memory, and data transfer to and from peripherals. There are 4K of CRU bits. Of these 4K, the last 1.9K (addresses >1000 to >1FFE) are used for peripherals attached to the I/O port. Each peripheral is assigned 128 CRU bits for its use. These definitions are listed in the table below.

```
+-----+
! COMMUNICATIONS REGISTER UNIT !
+-----+

>0000 - 03FE CRU TMS 9901 SPACE
>0400 - 10FE RESERVED
>1000 - 10FE TEST BITS
>1100 - 11FE DISK CONTROLLER
>1200 - 12FE HOME SECURITY
>1300 - 13FE PRIMARY RS-232
>1400 - 14FE MODEM
>1500 - 15FE SECONDARY RS-232
>1600 - 16FE DIGITAL CASSETTE
>1700 - 17FE HEX-BUS
>1800 - 18FE THERMAL PRINTER
>1900 - 19FE EPROM PROGRAMMER
>1A00 - 1AFE STUDENT TYPING
>1B00 - 1BFE UNASSIGNED
>1C00 - 1CFE VIDEO CONTROLLER CARD
>1D00 - 1DFE IEE 488 CONTROLLER
>1E00 - 1EFE UNASSIGNED
>1F00 - 1FFE P-CODE CARD
```

From the table, it can be seen that many peripherals were planned for the 99/4A. Many never appeared however, due to the fact that the 99/4A was pulled from the market before they were put into production.

The CRU base address of each peripheral is the Memory Enable bit. Setting the bit to 1 turns the device ROM/RAM on. Resetting it to 0 turns it off. When the bit is set the device ROM will be "paged in" to the memory space >4000 - >5FFF. At this time this area can be accessed just like any other ROM in the console.

For information on CRU access and DSR's consult the TI Editor Assembler manual.

Today there are a number of cards which utilize the CRU addresses - but you will still notice several designations which have never been developed.

Freeware/Shareware: A time for a change by Mark Beck

The FREEWARE concept is not working! This idea was a good one at first, but relied heavily on the honesty of the person obtaining the software. I'm not saying that anybody is dishonest, just that the concept allows people to get programs for "free". We have proven that the TI 99/4A is here to stay. Let's not "pull the plug" by expecting programmers to create programs and just give them away! I have an idea which will help the software user, user groups and software creators. We need to realize that a break in this triad will cause the downfall of the 99/4A.

I am the author of CREATIVE FILING SYSTEM. I tried to sell this commercially at the same time Navarone and others were releasing their database programs. Competition was tough and sales were few. I decided to release it as FREEWARE. Requests picked up because user groups wanted a copy for their library. to pass it on to their members. With more than 400 user groups and 250,000 members only 60 people paid for my program. Generally the person paying for the program was the group librarian. Once the group had it, the money would stop.

My strategy was to send flyers to all TI user groups and have them conduct a review. According to the reviews conducted, the program is an excellent one with many features. There are copies of my program on GENIE and probably all the other BBS's around the country.

I feel that something different has to be done concerning the FREEWARE concept. My interpretation is that a person may obtain a copy of a program and pass it on to someone else FREE! This idea was a good one at first because it saved the TI 99 from going completely under.

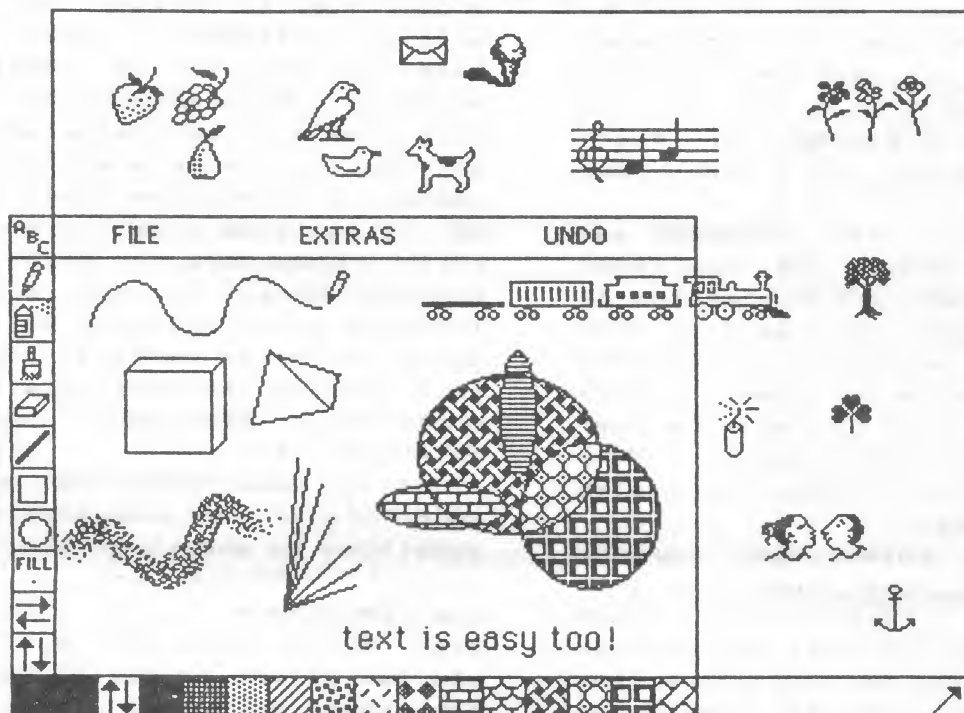
NEW! FROM THE CREATORS OF BANNER '99 AND EXTENDED BUSINESS GRAPHS.....

JOY PAINT '99

(C) Copyright 1986

ENTIRELY
JOYSTICK
CONTROLLED!!

USE TOOLS,
SUCH AS
PENCIL,
ERASER,
PAINT BRUSH
CIRCLE, OVAL
BOX, LINE &
TEXT!



92% MORE
GRAPHICS
SPACE THAN
PREVIOUS
TI GRAPHICS
PROGRAMS!!

THE SCREEN
ACTS LIKE
A WINDOW!

screen size Joy Paint '99 graphics page size
(shown smaller than actual print size)

REQUIRES

TI-99/4A, 32K,
Disk drive,
Joy Stick, and
one of the
following:
Extended Basic,
Editor/Assm,
or Mini-Memory.

Epson compatible
printer such as
Gemini 10x or
15x, TI impact,
etc. is optional.

(soon other
printers too!)

Our all new 100% assembly language program features graphic capabilities found in no other software application. Use JOY PAINT '99 to create signs, charts, diagrams, advertisements, or graphics of any type. JOY PAINT '99 is sophisticated, yet simple to use. In fact, the user never needs to touch the keyboard; all functions are joystick controlled. There are no complicated function keys to remember, just simple on-screen TOOLS. JOY PAINT '99 allows circles and ovals to be drawn with incredible speed and precision. Lines, boxes and rectangles can also be quickly drawn! Additionally, the FILL, PAINT BRUSH, and SPRAY-CAN tools allow filling and painting in any one of twenty six selectable PATTERNS! JOY PAINT '99 also feature 8 different brush shapes!

A 'pull down window' contains many more features that make creating and manipulating graphics fun and easy. Any object can be INVERTED, ROTATED, FLIPPED VERICALLY or HORIZONTALLY, COPIED, MOVED, OR STORED ON A CLIPBOARD! A MAGNIFY feature allows graphics to be increased. A ZOOM OPTION, called FATPIXELS, allows fine single dot editing.

JOY PAINT '99 also contains dozens of features not found in any other graphics application. For instance an 'UNDO' feature that instantly 'takes back' the last portion of work the user performed! Its DIRECTORY feature can catalog your diskettes! JOY PAINT '99 CONSERVES DISK SPACE, by not saving the redundant blank areas in your graphics! Printouts can be made directly in normal, or double size, and in single or double density! Be among the first to experience this unique and practical program; ORDER YOURS TODAY.....\$49.95 POSTPAID.

COMING SOON:
JOY PAINT '99
COMPANION!

With hundreds
of pre-designed
graphics!

GREAT LAKES SOFTWARE
804 E. Grand River Ave., Howell, MI 48843

Sophisticated software required better hardware. Better hardware encouraged better software. As you can see, they work hand in hand. We are cutting our own throats by neglecting the programmers. What incentive is there for a programmer to write a sophisticated program?

Who can't afford \$10.00 or \$15.00 for software? People spend many thousands on their computer and yet refuse to pay ANYTHING for software. Try and run a computer without software. Better yet, try writing all your own programs for every application needed to run your computer.

First of all, the FREEWARE and SHAREWARE names should be abolished completely. They are misleading at best. People have to realize that programmers are not going to continue developing software for free. Users have to realize that the show is over and it's time to pay. Your investment in your computer system may be lost forever!

My idea is this; user groups should purchase the right to sell programs for an initial fee. This will allow them to sell the program in any fashion and for any price they wish. Authors would create an agreement contract for the right to sell the program. The user group in turn gives the author a fixed amount or fee for every copy sold. The balance goes to the group. Fees would be listed in the contract.

The advantage for the users is that they are placed on a mailing list for updates. They have a source of information for problems or bugs. Users can also play a more active role in software development by requesting changes in the programs. As far as the user group is concerned, they should conduct reviews of the program, promote it and send suggestions to the author for improvements. In the end, the user group has a tool to make money, the user is assured he will have quality software to run on the 99/4A and authors will continue to create quality software.

I don't plan to get rich selling my program - nor do I plan to continue to work many long hours,

spend my money for postage and disk mailers all for nothing. Even though I love to correspond with other TI owners, I cannot continue to receive nothing in return. The money I have received barely covers the postage, disk mailers and disks. \$10.00 is not very much considering that it took 4 years to develop the program to its present level. The users groups need to be more involved with selling software. I feel that it is time to stop doing something for nothing. Programmers can't keep the ship from sinking themselves. What I am looking for is a sign from the TI community showing me that they want me to continue creating programs for their computers. Sixty persons sending money is not a good sign. I'm sure other software authors would agree with me on this. Maybe there is a name we can call this new idea: SHARE/PAY GROUPWARE SUPPORTWARE TRIALWARE etc.

If you have "FREEWARE" programs in your library, please send the author something to show that you want the support. I know money is tight. If you can afford to buy a new card or disk drive for your system, surely you can afford to pay \$5.00 or \$10.00 for your software. I would even be satisfied with even \$1.00 for every person who has a copy of my program!

I am interested in knowing your feelings on this subject. Write me at the address listed. Remember, computers won't work without software. I need you and you need me.

Mark Beck V.P. Jacksonville U.G.
166 Delaware Circle, Jacksonville,
AR 72076

Editors notes: THERE IS NO FREE LUNCH! The only approach seen to work is one of providing MINIMAL DOCUMENTATION with the program. Ask for a payment. Offer more complete documentation or source code for the payment. Ask for a payment again when the program runs (for the first time every day) with a code given to erase that feature for everyone who orders the documentation.

Other concepts have not proven to work according to many of the authors.

32K INTERNAL DESIGN:

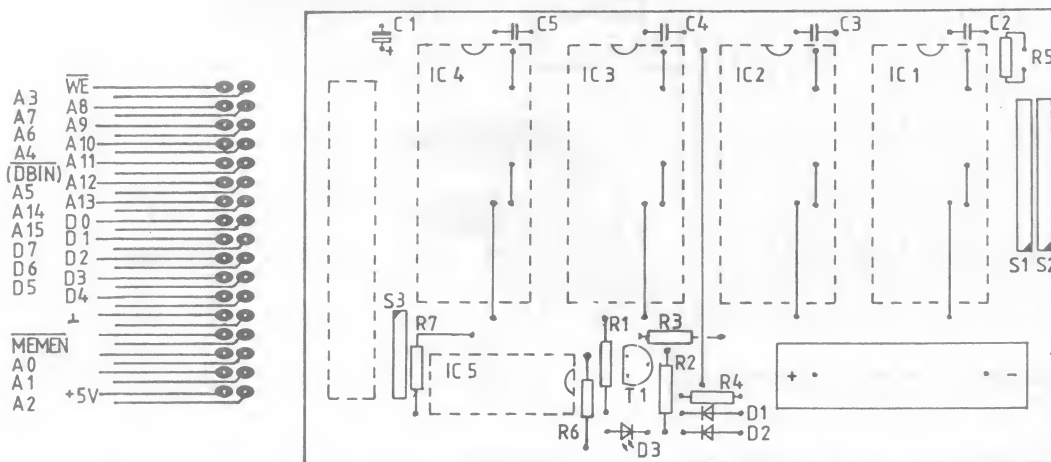
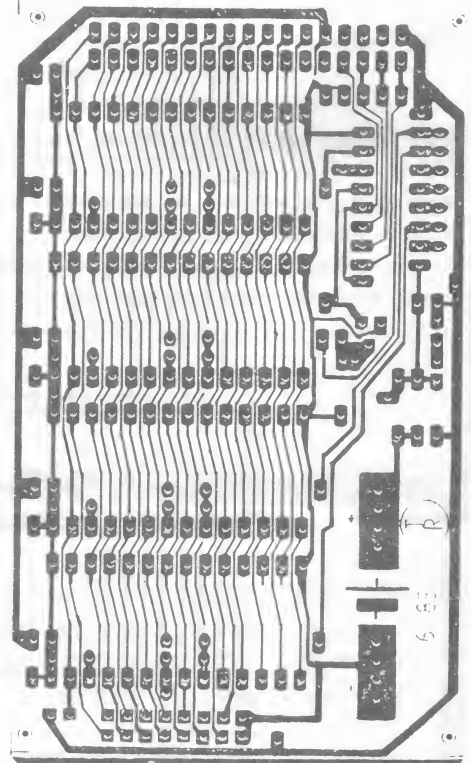
The following design is to allow you to add the "mapped" 32k memory inside your console.

For many TI owners, this is a logical step over a console system. Such memory will allow you to use Extended Basic and the High Speed Cassette Loader system reported on last month.

The board design will enable you to construct the entire project on a simple single sided board. The more ambitious can purchase a board kit for a reasonable price. A users group can etch a certain number of boards to reduce the cost. You can order this board from Elektronik Service, 27 Linning, Karrst, West Germany for 17 DM. Send them an international postal money order for the number of boards you require.

You can see from the diagram that the wiring is very easy. You can add the lines from the bus by using the speech synthesizer and tack soldering the lines required on the I/O port.

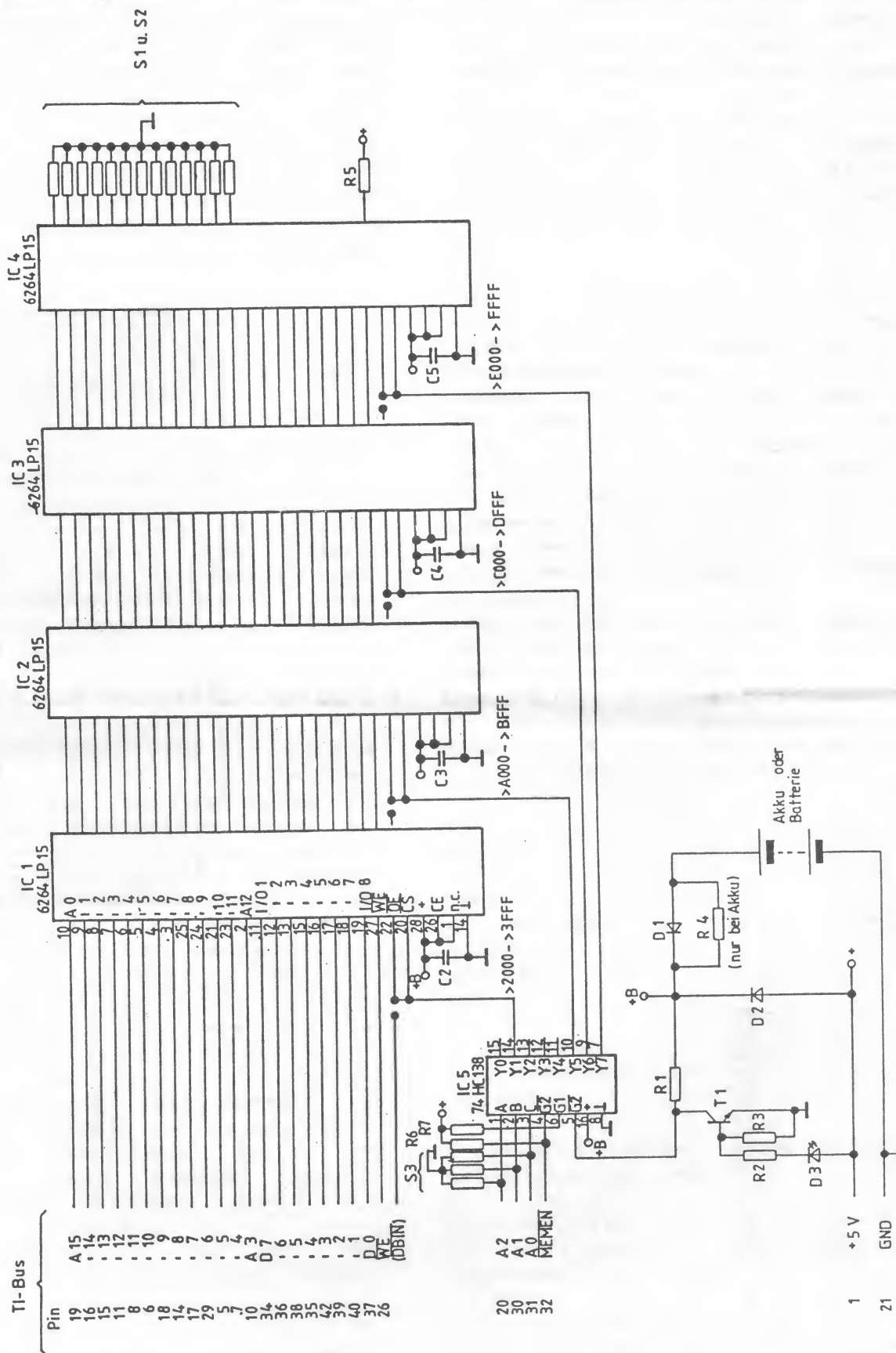
TI bus. This can be accomplished at the I/O port or at the back of the GROM port. This design assumes that the I/O port is used. The 74 HC 138 chip acts to select the 8K banks used. Note the battery backup in the diagram. THIS IS NOT RECOMMENDED. Some people have had problems with battery units feeding back into the computer circuits.



The basics of this expansion include wiring the address and data lines of 8k RAM chips - 6264 LP 15's to the correct address and data lines of the

Dear Sirs;

I have been meaning to write for some time now, but never seem to have enough time. I really enjoy making



Thomas Rademacher 08.85

32 K Speichererweiterung

Schaltplan

TI 99 / 4A

small hardware changes and building interesting kits for my computer, but I don't have the knowledge to make changes without instruction. Your newsletter is my only source of ideas and without it, I would probably grow tired of my 99/4A. I have other computers, but my 99/4A is my hackers computer. It was literally made for expansion and modification. Because I am so dependent on your newsletter for information, I have at times become upset when I did not receive a newsletter. Rest assured, I understand the work and problems that go with it. I also understand that you have no control over the postal system.

I just received VER 15 September with a note from the postmaster. Apparently it was caught in their machinery and almost burned up. I like to request a copy of VER 15 to replace this one.

One thing I was able to pick out of

VER 15 was replacing the 9918A with a 9928. I was very interested in the article but I could only read a small part of it. The author mentions that he will supply the chips and instructions, but I can't read the name or address.

I have read some very interesting comments about the new Geneve and I was hoping you have seen one. I have seen demos of the Amiga, and the graphics were really impressive. Does the Geneve have comparable graphics? If so, is it only with RGB? Will composite support 80 columns? In closing, I would like to thank you for the work and support you've given the 99/4A. Without people like you, this computer wouldn't have a chance of surviving. Because of people like you, the 99/4A seems to be thriving - at least as far as new products and new ideas are concerned.

Good luck, Bob Keheay

Artist Instances

Now! for users of *TI-Artist* and *Font-Writer*! The most extensive, complete library of instances ever produced, exclusively from **Asgard Software**. Each single disk volume in the **Artist Instances** series is a valuable collection of highly-detailed instance clipart for use in any graphics project. Each individual volume is fully documented with explanatory notes and usage tips for *Font-Writer* and *TI-Artist* users. Each collection contains only the best artwork individually culled from hundreds of files and arranged by subject matter. Finally, each volume is available for an incredible price of only \$9.00 each!

- Volume #1 - *Animals 1*: A complete collection of domestic, wild and fanciful animals.
- Volume #2 - *Animals 2*: More familiar and rare animals to decorate and enhance your creations.
- Volume #3 - *Holidays*: A volume dedicated exclusively to those very special days of the year.
- Volume #4 - *Home*: A vast library of works depicting implements of the home and home repair, and of personal items.
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E/A to GRAM Card memory conversion

Monty Schmidt, November, 1986

By following the step by step instructions in this article you will be able to convert your EDITOR/ASSEMBLER cartridge and disk to run within memory using the Mechatronic Gram Card. The cartridge will perform the same except for the fact that loading either the editor or assembler files will be instantaneous since they will now be stored in 3 of the Gram segments in the card. The first part of the article describes how to perform this modification. The second part describes how it works. You need not read part two to use part one!

Section 1 - Installing the new EDITOR/ASSEMBLER

- 1) Initialize a new disk.
- 2) Copy the files ASSM1, ASSM2, and EDIT1 onto this disk in the order they are listed here: ASSM1, ASSM2, EDIT1
- 3) Next use a sector editor program such as DISK-PATCH or DISK FIXER to modify the sectors >20, >40, and >53. Only the first 22 bytes of each sector need to be modified. Below are listings of the original 22 bytes of the sector and the values to which they should be changed:

NOTE: If the bytes you see in the sector are not the same as the originals listed here DO NOT continue. Repeat steps 1 and 2. Either you are not working with a newly initialized disk or you have copied the files in incorrect order!

SECTOR >20

Original:

```
FFFF 2000 2000 AA55 2004 0420 289E
0000 0000 0000 0000
```

Change to:

```
ASA5 A000 2000 0000 0000 0000 0000
0000 0000 0000 0000
```

SECTOR >40

Original:

```
0000 1206 A000 A58A A02A 0000 A10E
A10E FB7C 3A13 0D0A
```

Change to:

```
ASA5 C000 1206 0000 0000 0000 0000
0000 0000 0000 0000
```

SECTOR >53

Original:

```
0000 1700 2000 55AA 2012 2016 201A
0000 0000 0000 0000
```

Change to:

```
ASA5 8000 1700 0000 0000 0000 0000
0000 0000 0000 0000
```

- 4) Insert your EDITOR/ASSEMBLER cartridge in the console and select 1 for TI BASIC. Bring up the Gram Card screen by entering CALL GRAM. When the menu shows up select option 5 for SAVE GROM. Enter 6000 for the start address and 7800 for the end address. Press enter to the GROM-ADR prompt to default to the >9800 Grom address. Save the Grom in the file name DSK1.E/AG3. After you receive the message COMMAND COMPLETED press function = <quit>, to return to the title screen.

- 5) Remove the EDITOR/ASSEMBLER cartridge and re-boot the system. Select 1 for TI BASIC. Enter CALL GRAM to get to the Gram Card menu and select option 1 LOAD (G)RAM WITH PROGRAM. Select a base of >9800 by pressing enter to the GRAM-A: prompt, and enter the file name DSK1.E/AG3. After the Gram Card returns the message COMMAND COMPLETED return to the title screen using Function = (QUIT).

- 6) Again select 1 for TI BASIC. This time enter CALL EDITMEM. This will

bring you to the memory editor of the Gram Card. Press G for grom and

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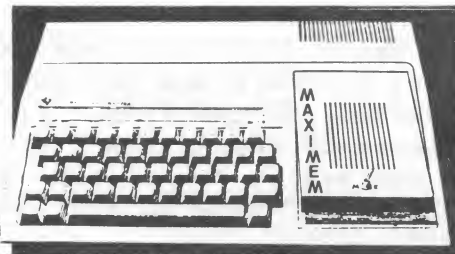
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enter the address 7730. at the START MEMORY: prompt. Press enter to to the GRAM-ADDRESS: prompt for a address of >9800. You will now be able to change the gram memory of the EDITOR/ASSEMBLER cartridge. In the area from >7730 to >77D8 there is nothing but zero's. Change these to the values listed below.

| | |
|------|-------------------------|
| 7730 | 07 20 31 20 00 8F 9D 00 |
| 7738 | A0 00 31 12 06 8F 1D 00 |
| 7740 | C0 00 31 00 14 8F 9D 00 |
| 7748 | 77 60 31 00 14 8F 1D 00 |
| 7750 | 77 80 00 00 00 00 00 00 |
| 7758 | 00 00 00 00 00 00 00 00 |
| 7760 | AA 55 20 04 04 20 28 9E |
| 7768 | 00 00 00 00 00 00 00 00 |
| 7770 | 00 04 10 80 00 00 00 00 |
| 7778 | 00 00 00 00 00 00 00 00 |
| 7780 | A5 8A A0 2A 00 00 A1 0E |
| 7788 | A1 03 FB 7C 3A 13 0D 0A |
| 7790 | 14 FF 00 00 00 00 00 00 |
| 7798 | 00 00 00 00 00 00 00 00 |
| 77A0 | 31 17 00 8F 9D 00 80 00 |
| 77A8 | 31 00 14 8F 9D 00 77 C0 |
| 77B0 | 00 00 00 00 00 00 00 00 |
| 77B8 | 00 00 00 00 00 00 00 00 |
| 77C0 | 55 AA 20 12 20 16 20 1A |
| 77C8 | 00 00 00 00 00 00 00 00 |
| 77D0 | 00 00 04 20 00 00 00 00 |

After modifying the gram press function 9 <back>, to return to the EDITMEM screen. There are four other bytes you must modify in the Gram. Again press G for Grom. Enter 61F0 for the address and press enter to the GRAM-ADDRESS: prompt. Change the memory listed below to the new values.

Original:

| | |
|------|-------------------------|
| 61F0 | FC 06 65 B2 66 23 06 65 |
| 61F8 | D4 06 65 49 D6 04 01 62 |

Change to:

| | |
|------|-------------------------|
| 61F0 | FC 06 65 B2 66 23 06 77 |
| 61F8 | A0 06 65 49 D6 04 01 62 |

After modifying the gram press function 9 <back>, to return to the EDITMEM screen. Once more press G for Grom. Enter 6680 for the address and press enter to the GRAM-ADDRESS: prompt. Change the memory listed

below to the new values.

Original:

| | |
|------|-------------------------|
| 6680 | 65 B2 66 28 06 65 D4 BF |
|------|-------------------------|

Change to:

| | |
|------|-------------------------|
| 6680 | 65 B2 66 28 06 77 30 BF |
|------|-------------------------|

After modifying the Gram data press function 9 <back> to return to the Edit Memory main screen and then press function 5 <begin> to return to TI BASIC.

7) Now that you are back in BASIC enter CALL GRAM to get to the Gram Card main menu. You must now save the modified Gram as you did before in step 4. Select option 5 to save the GROM and again save addresses 6000 to 7800 and the file name DSK1.E/AG3. Exit back to the main screen.

8) The last step is to set up a load file for the new EDITOR/ASSEMBLER. Use a text editor such as TI/WRITER or EDITOR/ASSEMBLER. If you use TI/WRITER make sure you are using "fixed" mode so there are no control codes embedded in the file. If you see the little CR characters in the file then you are in "word-wrap" mode and this is wrong! Type in the lines:

```
DSK1.E/AG3
DSK1.ASSM1
DSK1.ASSM2
DSK1.EDIT1
```

Make sure you have a blank line as the last line in the file! Save this file to disk as DSK1.EA. You are now done! To load the new EDITOR/ASSEMBLER just reset the system (including the P-BOX to wipe out the current Grams) and select option 2 GRAM CARD >9800 on the menu. Then from the Loader screen press 3 DSK1.EA and you now have your new program running! No more waiting for the EDITOR or ASSEMBLER files to load! This should save a lot of time when you are working on assembly files.

Section 2 - How it all works:

Steps 1 and 2 -- The reason for using a newly initialized disk and copying the files in order is to assure that the beginning sectors of each file are in the correct spots for modification. Although these steps are not necessary if you know how to find the starting sectors of each file they make it easier for the non-technical user.

Step 3 -- The reason for modifying the first six bytes in the sectors is to get them in a format that the Gram

Card loader recognizes. The first

two bytes A5A5 tell the loader that

the file is to be loaded into a Gram

location. The second two bytes tell the loader which Gram address to load the file in. The last two bytes tell the loader how many bytes in Gram the file takes up. The next sixteen bytes are set to 00 in order to keep the GPL interpreter from thinking there are power-up or application programs in these Gram blocks. The three files when loaded are now loaded as follows:

```
EDIT1 -- GRAM4 Memory location >8000
ASSM1 -- GRAM5 Memory location >A000
ASSM2 -- GRAM6 Memory location >C000
```

Steps 4 and 5 -- These steps are executed in order to install Gram memory which can be modified and saved. This is so we can actually change the operation of the E/A module.

Step 6 -- This is the actual "meat" which allows us to keep the files from having to be loaded from disk. Since the code from the files is now in Gram rather than on the disk it must be moved into the correct RAM area from the Gram. To do this I had to write two short "loader" programs in GPL to do this and then replace the calls to the disk load routine within the E/A code to call these routines rather than the disk routine. The disk loader routine is found at location >65D4 in Gram.

Thus I replaced these two calls within the EDITOR and ASSEMBLER routines with my new loader routine addresses. This is why the memory locations at >61F7 and >6685 were changed to >77A0 and >7730 respectively. I placed the new loader routines at the end of the E/A gram code since there was space there. Listed below is the GPL code which comprises the new loader routines.

```
** Assembler loader
>7730 ALL >20 ** Clear the screen
MOVE >2000,G>A000,>2000 ** Load low
mem with ASSM1 data
MOVE >1206,G>C000,>A000 ** Load
highmem with ASSM2 data
MOVE 20,G>7760,>2000 ** Replace
deleted data, ASSM1
MOVE 20,G>7780,>A000 ** Replace
deleted data, ASSM2
RTN
```

```
** This is the data removed from the
first sector, ASSM1
>7760 DATA >AA55, >2004, >0420
        >289E,>0000
        DATA >0000,>0000,>0000,>0004,>1080
** This is the data removed from the
first sector, ASSM2
>7780 DATA >A58A, >A02A, >0000
        >A10E,>A10E
        DATA >FB7C,>3A13,>0D0A,>14FF,>0000
```

```
** Editor loader
>77A0 MOVE >1700,G>8000,>2000 ** Load
high mem with EDIT1 data
MOVE 20,G>77C0,>2000 ** Replace
deleted data, EDIT1
RTN
```

```
** This is the data removed from the
first sector, EDIT1
>77C0 DATA >55AA, >2012, >2016,
        >201A,>0000
        DATA >0000,>0000,>0000,>0000,>0420
```

The data inserted from >7730 - >77D8 is the object code of this source file.

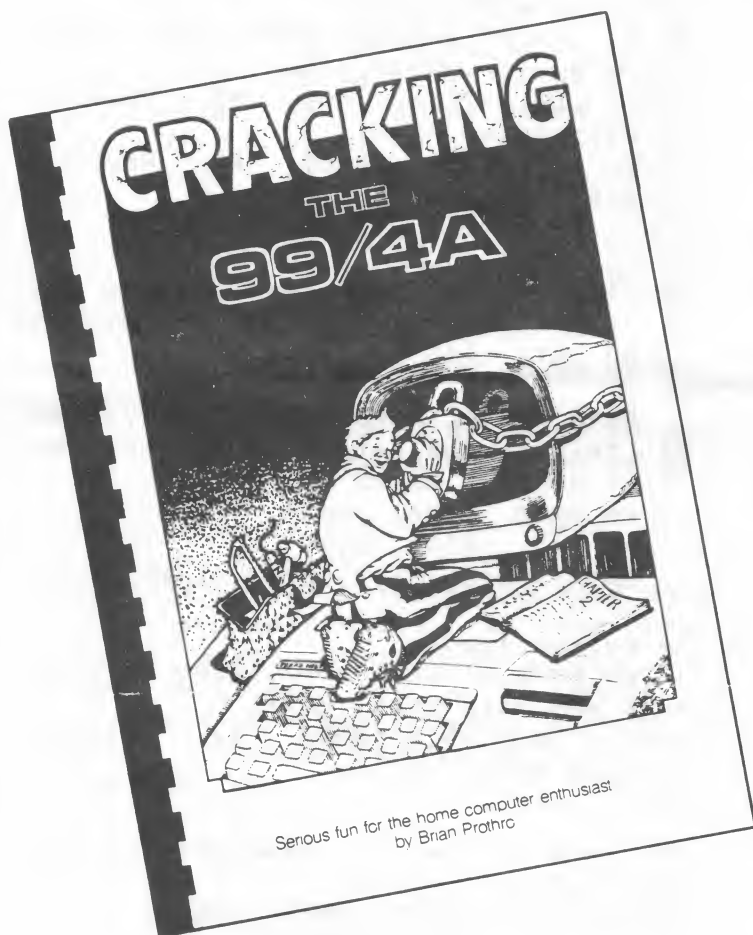
Step 7 -- This step saves the new Gram back to disk for the new E/A cartridge.

Step 8 -- The last step sets up a load file so the new files are brought in at the touch of a key.

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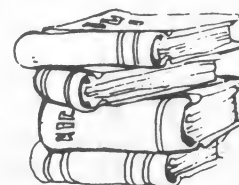


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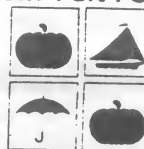
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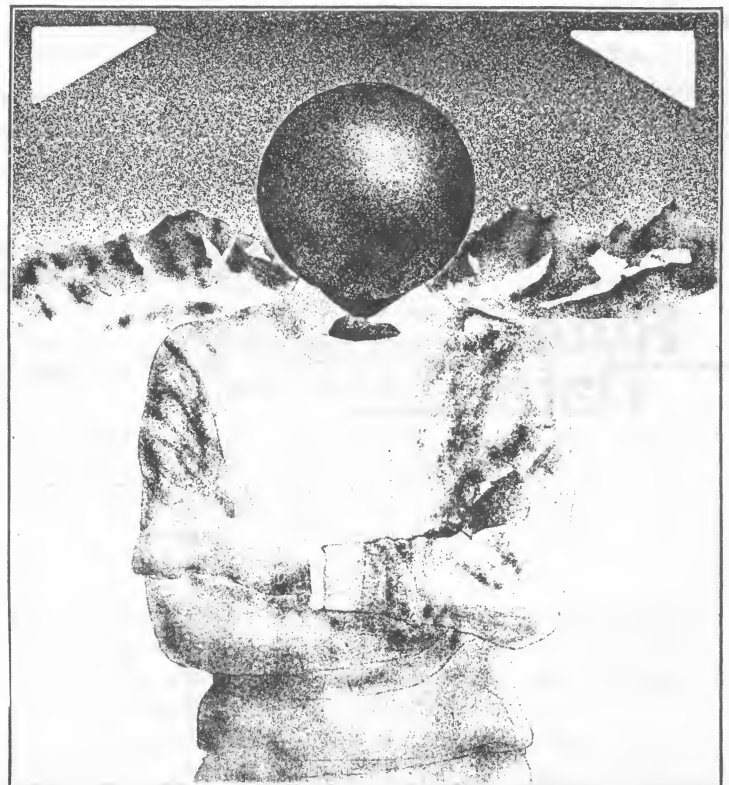
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